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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* JACK H. HETHERINGTON

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Appeal 2008-3150  
Application 09/684,205  
Technology Center 2600

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Decided:<sup>1</sup> April 9, 2009

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Before KENNETH W. HAIRSTON, LANCE LEONARD BARRY, and  
JOHN A. JEFFERY, *Administrative Patent Judges*.

BARRY, *Administrative Patent Judge*.

DECISION ON APPEAL

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<sup>1</sup> The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, begins to run from the decided date shown on this page of the decision. The time period does not run from the Mail Date (paper delivery) or Notification Date (electronic delivery).

### STATEMENT OF THE CASE

The Patent Examiner rejected claims 1-3, 6, 11, 12, 15, 16, 18, 19, 21, 22, 27, 28, and 36. The Appellant appeals therefrom under 35 U.S.C. § 134(a). We have jurisdiction under 35 U.S.C. § 6(b).

### INVENTION

The invention at issue on appeal is a capacitive position sensor that employs a movable dielectric coupled to an elongated member. More specifically, the movable dielectric is supported between stationary, signal-transmitting plates and at least one stationary, signal-detecting plate. By measuring the charge on the detecting plate, a microprocessor determines the capacitance of the assembly. The microprocessor then uses the capacitance to calculate the position of the dielectric and the member. (Spec. 7.)

In contrast to existing devices featuring potentiometers, optical couplers, or electrical contacts, asserts the Appellant, the moving dielectric offers low cost and power and ease of manufacture and maintenance. He adds that his invention can be used to measure the position of a variety of devices including computer mice, keyboards, and joysticks. (*Id.*)

### ILLUSTRATIVE CLAIM

1. A capacitive position sensor configured for interconnection to a utilization device, comprising:
  - a stationary signal-detecting capacitor plate;
  - a stationary signal-transmitting capacitor plate supported parallel to, and spaced apart from, the signal-detecting capacitor

plate, the transmitting capacitor plate being divided into a plurality of electrically separated segments;

a non-circular, movable dielectric element disposed between the signal detecting and signal- transmitting capacitor plates;

an elongate member having a user-manipulable [sic] proximal end and a distal end coupled to the dielectric element, the member being operative to rotate and laterally shift the element in the x or y directions in a plane substantially parallel to the stationary plates as a function of user position;

circuitry in electrical communication with the stationary plates, the circuitry being operative to (a) measure the capacitance between each segment of the signal-transmitting plate and the signal- detecting plate, (b) determine the position of the elongate member in the x and y directions as a function of the measured capacitance, and (c) determine rotation of the elongate member as a function of the measured capacitance, with or without lateral shifting of the dielectric element; and

an output for communicating the x-y position and rotation to the utilization device.

#### PRIOR ART

Brasseur	US 5,598,153	Jan. 28, 1997
Dammeyer	WO 98/50759	Nov. 12, 1998

#### REJECTIONS

Claims 1-3, 6, 11, 12, 15, 16, 18, 19, 21, 22, 27, 28, and 36 stand rejected under 35 U.S.C. § 112 para. 2, as indefinite.

Claims 1-3, 6, 18, 19, 21, 22, 27, 28, and 36 stand rejected under 35 U.S.C. § 112 para. 1, as lacking an adequate written description.

Claims 1-3, 6, 11, 12, 15, 16, 18, 19, 21, 22, and 36 stand rejected under 35 U.S.C. § 103(a) as being obvious over Dammeyer and Brasseur.

#### DEFINITENESS OF CLAIMS 1-3, 6, 18, 19, 21, 22, 27, AND 36

"Rather than reiterate the positions of parties *in toto*, we focus on the issues therebetween." *Ex parte Katsukawa*, No. 2007-0732, 2007 WL 3043602 at \*2 (BPAI 2007). Finding that "claim 1 recites both a rotation of the elongate member and a rotation of the dielectric element in lines 9-16 and while a limitation, 'an output for communicating . . . rotation to the utilization device' in last line of claim 1 requires a **single 'rotation'** communicated to the utilization device" (Answer 8), the "[E]xaminer considers the claimed invention being not clearly defined" (*id.*). The Appellant argues that "[t]here seems to be no ambiguity that the user can either rotate or laterally shift the elongate member which, in turn, rotates or laterally shifts the moving dielectric in order to change capacitance and provide for control of a utilization device." (Appeal Br. 4.)

#### ISSUE

Therefore, the issue before us is whether the Appellant has shown error in the Examiner's conclusion that claims 1-3, 6, 18, 19, 21, 22, 27, and 36 are indefinite.

## LAW

"The legal standard for definiteness is whether a claim reasonably apprises those of skill in the art of its scope." *In re Warmerdam*, 33 F.3d 1354, 1361 (Fed. Cir. 1994) (citing *Amgen Inc. v. Chugai Pharmaceutical Co. Ltd.*, 927 F.2d 1200, 1217 (Fed. Cir.1991)). The "inquiry therefore is merely to determine whether the claims do, in fact, set out and circumscribe a particular area with a reasonable degree of precision and particularity." *In re Moore*, 439 F.2d 1232, 1235 (CCPA 1971). "[T]he definiteness of the language employed must be analyzed - not in a vacuum, but always in light of the teachings of the prior art and of the particular application disclosure as it would be interpreted by one possessing the ordinary level of skill in the pertinent art." *Id.*

## FINDING OF FACT ("FF")

1. Claim 1 recites in pertinent part the following limitations:

a non-circular, movable dielectric element disposed between the signal detecting and signal- transmitting capacitor plates;

an elongate member having a user-manipulable [sic] proximal end and a distal end coupled to the dielectric element, the member being operative to rotate and laterally shift the element in the x or y directions in a plane substantially parallel to the stationary plates as a function of user position;

circuitry in electrical communication with the stationary plates, the circuitry being operative to (a) measure the capacitance between each segment of the signal-transmitting plate and the signal- detecting plate, (b) determine the position of the elongate member in the x and y directions as a function of the measured capacitance, and (c) determine rotation of the

elongate member as a function of the measured capacitance,  
with or without lateral shifting of the dielectric element; and  
an output for communicating the x-y position and  
rotation to the utilization device.

#### ANALYSIS

We agree with the Appellant that one possessing the ordinary level of skill in the pertinent art would interpret the limitation "an elongate member . . . being operative to rotate . . . the element" (FF 1) to mean that a user can rotate the elongate member which, in turn, rotates the moving dielectric. With this meaning, we conclude that one possessing ordinary level of skill in the pertinent art would have interpreted the limitation "communicating the . . . rotation to the utilization device" (*id.*) to mean communicating the rotation of the moving dielectric, which was caused by the rotation of the elongate member.

#### CONCLUSION

Based on the aforementioned facts and analysis, we conclude that the Appellant has shown error in the Examiner's conclusion that claims 1-3, 6, 18, 19, 21, 22, 27, and 36 are indefinite.

#### INDEFINITENESS OF CLAIMS 11, 12, 15, 16, AND 28

Finding that "independent claim 11 recites the limitation '**the elongate member**' in lines 16 and 17" (Answer 3), the Examiner concludes that "[t]here is insufficient antecedent basis for this limitation in the claim" (*id.*).

The Appellant argues that "'the elongate member' has been changed to 'joystick lever,' thereby overcoming the objection on the basis of insufficient antecedent basis." (Appeal Br. 3.)

#### ISSUE

Therefore, the issue before us is whether the Appellant has shown error in the Examiner's conclusion that claims 11, 12, 15, 16, and 28 are indefinite.

#### LAW

A claim is indefinite "where the language 'said lever' appears in a dependent claim where no such 'lever' has been previously recited in a parent claim to that dependent claim . . . ." *Ex parte Moelands*, 3 USPQ2d 1474, 1476 (BPAI 1987).

#### FINDING OF FACT

2. Claim 11 recites in pertinent part the following limitations:

a joystick lever supported for pivotal movement having a proximal end for user engagement and a distal end loosely coupled to the dielectric element, enabling the lever to rotate and laterally shift the dielectric element in x and y directions in a plane substantially parallel to the stationary plates as a function of user position;

circuitry in electrical communication with the stationary plates, the circuitry being operative to (a) measure the capacitance between each segment of the signal-transmitting plate and the signal- detecting plate, (b) determine the position of *the elongate member* . . . , and (c) determine rotation of *the elongate member* . . . .



(Appeal Br. 9 (emphases added).)

#### ANALYSIS

Claim 11 twice recites the language "the elongate member," without previously reciting such "an elongate member." Instead, the claim previously recites "a joystick lever," which provides no antecedent basis for "the elongate member." We agree with the Examiner that the lack of antecedent basis makes claim 11 and claims 12, 15, 16, and 28, which depend therefrom, indefinite.

#### CONCLUSION

Based on the aforementioned facts and analysis, we conclude that the Appellant has shown no error in the Examiner's conclusion that claims 11, 12, 15, 16, and 28 are indefinite.

#### WRITTEN DESCRIPTION OF

#### CLAIMS 1-3, 6, 18, 19, 21, 22, 27, 28, AND 36

The Examiner finds that claim 1's "limitation, 'an output for communicating . . . **rotation** to the utilization device' was not recited in all original claims' . . . ." (Answer 9.) Regarding claims 27 and 28, he also finds that "the disclosure, when filed, does not fairly convey to one of ordinary skill in the art that applicants had in their possession the claimed limitation, 'the dielectric element has a periphery described by:  $r(\Theta) = r_0 + a_2\cos(2\Theta) + a_3\cos(3\Theta)$ '". (*Id.* at 4.)

The Appellant argues that "the Examiner continues to assert that the joystick (or 'elongate member') does not communicate rotation to the utilization device. Of course it does. This is not only true from the claims but also the specification, the drawings and the disclosure overall." (Reply Br. 1.) He also argues that "the formula used by Appellant in claims 27 and 28 do [sic] indeed, describe the periphery, in a neutral position without translation or rotation, as clearly shown in Figure 7 of the specification as originally filed." (Appeal Br. 4.)

#### ISSUE

Therefore, the issue before us is whether the Appellant has shown error in the Examiner's finding that claims 1-3, 6, 18, 19, 21, 22, 27, 28, and 36 lack an adequate written description.

#### LAW

"[T]he test for sufficiency of support . . . is whether the disclosure of the application relied upon 'reasonably conveys to the artisan that the inventor had possession at that time of the later claimed subject matter.'" *Ralston Purina Co. v. Far-Mar-Co., Inc.*, 772 F.2d 1570, 1575 (Fed. Cir. 1985) (quoting *In re Kaslow*, 707 F.2d 1366, 1375 (Fed. Cir. 1983)).

#### FINDINGS OF FACT

3. Claim 1 currently recites in pertinent part "communicating the . . . rotation to the utilization device."

4. Claim 1 originally recited in pertinent part "an output for communicating the user position to the utilization device."

5. Claim 5 originally recited in pertinent part "[t]he position sensor according to claim 1, wherein movement of the elongate member causes the dielectric element to rotate within the plane without translation."

6. Claims 27 and 28 recite in pertinent part "'the dielectric element has a periphery described by:  $r(\Theta) = r_0 + a_2\cos(2\Theta) + a_3\cos(3\Theta)$ ."

7. The Specification (p. 13) originally disclosed in pertinent part "[w]hen displaced from the center and rotated, the formula for the perimeter of the dielectric is approximately  $\rho(\Theta) = r_0 + x \cos(\Theta) + y \sin(\Theta) + a_2\cos(2(\Theta + \Phi)) + a_3\cos(3(\Theta + \Phi))$ ."

#### ANALYSIS

Claim 1 currently specifies communicating rotation to the utilization device. (FF 3.) The same claim originally specified communicating the position of the elongate member to the utilization device (FF 4), and claim 5 originally specified that a movement of the elongate member caused the dielectric element to rotate (FF 5.) We agree with the Appellant "that the user can . . . rotate . . . the elongate member which, in turn, rotates . . . the moving dielectric . . . ." (Appeal Br. 4.) Therefore, we find that the original claims 1 and 5 collectively provided support for the communicating of rotation to the utilization device.

Claims 27 and 28 specify that the periphery of the dielectric element is described by the equation  $r(\Theta) = r_0 + a_2\cos(2\Theta) + a_3\cos(3\Theta)$ . (FF 6.) The Specification originally disclosed that the formula for the perimeter of the dielectric is approximately  $\rho(\Theta) = r_0 + x \cos(\Theta) + y \sin(\Theta) + a_2\cos(2(\Theta + \Phi)) + a_3\cos(3(\Theta + \Phi))$  when the dielectric element is "displaced from the center and rotated . . . ." (FF 7.) When the dielectric element is neither displaced from the center nor rotated, the value of  $x$ ,  $y$ , and  $\Phi$  in the latter equation is zero, which simplifies the latter equation to  $\rho(\Theta) = r_0 + a_2\cos(2\Theta) + a_3\cos(3\Theta)$ . We agree with the Appellant that this simplified formula provided support for the periphery of the dielectric element being described by the equation  $r(\Theta) = r_0 + a_2\cos(2\Theta) + a_3\cos(3\Theta)$ .

#### CONCLUSION

Based on the aforementioned facts and analysis, we conclude that the Appellant has shown error in the Examiner's finding that claims 1-3, 6, 18, 19, 21, 22, 27, 28, and 36 lack an adequate written description.

#### NONOBVIOUSNESS OF CLAIMS 1-3, 6, 11, 12, 15, 16, 18, 19, 21, 22, AND 36

The Examiner makes the following finding.

[B]y virtue of Fig. 5 the description on page 6, lines 15-21, Dammeyer teaches the elongate member (10) laterally shifting the dielectric element (30) (see Fig. 5) and both the elongate member (10) and the dielectric element (30) rotating around the reference location (75) such that a center of the opening 50 of

the dielectric element (30) travels (rotates) on a circle having a center at the reference location 75.

(Answer 10.) The Appellant argues that "it is clear from the Dammeyer reference that the position sensing device measures only x/y displacement, and not rotation." (Appeal Br. 5.)

#### ISSUE

Therefore, the issue before us is whether the Appellant has shown error in the Examiner's finding that Dammeyer determines, and outputs data representing, rotation.

#### LAW

The question of obviousness is "based on underlying factual determinations including . . . what th[e] prior art teaches explicitly and inherently . . . ." *In re Zurko*, 258 F.3d 1379, 1383 (Fed. Cir. 2001) (citing *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966); *In re Dembiczak*, 175 F.3d 994, 998 (Fed. Cir. 1999); *In re Napier*, 55 F.3d 610, 613 (Fed. Cir. 1995)).

#### FINDINGS OF FACT

8. Dammeyer discloses "[a] position sensing device for use on determining the location of a control handle or joy stick includes a dielectric element movable between a pair of spaced-apart printed circuit boards which have formed thereon a plurality of capacitors surrounding a central axis." (Abstract, ll. 1-7.)

9. "This invention relates to a control mechanism, such as a joy stick, that includes a position sensing device, particularly an X-Y position sensing device." (*Id.* at 1, ll. 3-4.) "[T]his invention . . . provide[s] method of determining the position of a control mechanism in an X- and Y- plane . . . ." (*Id.* at 2, ll. 9-10.)

10. "The output of the [reference's] capacitance measuring circuit is applied to a position determining circuit 85 whose output provides X- and Y-position information . . . ." (*Id.* at 7, ll. 6-7.)

11. Brasseur discloses a "[m]easuring device for the measurement of a rotor angle including a capacitive angular displacement transducer generating an output that varies with an angular displacement of a shaft." (Abstract, ll. 1-4.)

#### ANALYSIS

Dammeyer determines the X- and Y-position of a joy stick (FF 8-9) and outputs data representing that position (FF 10.) The reference, however, does not mention determining rotation of the joy stick. We agree with the Appellant, moreover, that "[s]ince the distal end of handle (15) of Dammeyer is round, and because it is received by a round hole, if the handle were simply rotated in place (i.e., without lateral displacement), the dielectric *would not move*." (Reply Br. 2.) Therefore, we also agree with him that the reference's "position sensing device measures only x/y displacement, and not rotation." (Appeal Br. 5.)

The Examiner does not allege, let alone show, that the addition of Brasseur cures the aforementioned deficiency of Dammeyer. For our part, we find that Brasseur measures the rotation of a rotor (FF 11) not a joy stick.

#### CONCLUSION

Based on the aforementioned facts and analysis, we conclude that the Appellant has shown error in the Examiner's finding that Dammeyer determines, and outputs data representing, rotation.

#### ORDER

We reverse the rejection of claims 1-3, 6, 18, 19, 21, 22, 27, and 36 under 35 U.S.C. § 112 para. 2, but affirm the rejection of claims 11, 12, 15, 16, and 28 under § 112 para. 2. We also reverse the rejection of claims 1-3, 6, 18, 19, 21, 22, 27, 28, and 36 under 35 U.S.C. § 112 para. 1 and the rejection of claims 1-3, 6, 11, 12, 15, 16, 18, 19, 21, 22, and 36 under 35 U.S.C. § 103(a).

No time for taking any action connected with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED-IN-PART

Appeal 2008-3150  
Application 09/684,205

msc

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